

## CLAIMS

What is claimed is:

- 1 1. A method for treating a wrinkle in human skin, comprising:  
2 generating a beam of radiation having a wavelength of between 1.3  
3 and 1.8 microns and a fluence of between 10 and 150 joules per square centimeter;  
4 directing the beam of radiation to a targeted dermal region between  
5 100 microns and 1.2 millimeters below a wrinkle in the skin; and  
6 causing thermal injury within the targeted dermal region to elicit a  
7 healing response that produces substantially unwrinkled skin.
- 1 2. The method of claim 1 wherein the wavelength is about 1.5 microns.
- 1 3. The method of claim 1 further comprising the step of stretching the skin  
2 along the wrinkle before the step of directing the beam of radiation to the targeted  
3 dermal region.
- 1 4. The method of claim 1 further comprising the step of cooling an epidermal  
2 region of the skin above the targeted dermal region contemporaneously with the  
3 step of causing thermal injury within the targeted dermal region.
- 1 5. The method of claim 4 further comprising the step of pre-cooling the  
2 epidermal region of the skin above the targeted dermal region before the step of  
3 causing thermal injury within the targeted dermal region.
- 1 6. A method for treating a wrinkle in human skin, comprising:  
2 generating a beam of radiation having a wavelength of between 1.3  
3 and 1.8 microns and a power density of between 5 and 100 watts per square  
4 centimeter;

5 directing the beam of radiation to a targeted dermal region between  
6 100 microns and 1.2 millimeters below a wrinkle in the skin; and  
7 causing thermal injury within the targeted dermal region to elicit a  
8 healing response that produces substantially unwrinkled skin.

1 7. The method of claim 6 wherein the wavelength is about 1.5 microns.

1 8. The method of claim 6 further comprising the step of stretching the skin  
2 along the wrinkle before the step of directing the beam of radiation to the targeted  
3 dermal region.

1 9. The method of claim 6 further comprising the step of cooling an epidermal  
2 region of the skin above the targeted dermal region contemporaneously with the  
3 step of causing thermal injury within the targeted dermal region.

1 10. The method of claim 9 further comprising the step of pre-cooling the  
2 epidermal region of the skin above the targeted dermal region before the step of  
3 causing thermal injury within the targeted dermal region.

1 11. An apparatus for treating a wrinkle in human skin, comprising:  
2 a source generating a beam of radiation having a wavelength of  
3 between 1.3 and 1.8 microns; and  
4 a delivery system coupled to the source, the delivery system  
5 directing the beam of radiation to a targeted dermal region between 100 microns  
6 and 1.2 millimeters below a wrinkle in the skin, wherein the beam of radiation  
7 causes thermal injury to the targeted dermal region sufficient to elicit a healing  
8 response that produces substantially unwrinkled skin, the delivery system further  
9 comprising:

10                                   a cooling system for contact cooling an epidermal region  
11 of the skin above the targeted dermal region, to thereby minimize injury to the  
12 epidermal region.

1    12.    The apparatus of claim 11 wherein the delivery system further comprises a  
2 fiber coupled to the source, the fiber carrying the beam of radiation; and  
3                                   wherein the cooling system further comprises a skin contacting  
4 portion having a first end in optical communication with the fiber and a second  
5 end, the skin contacting portion projecting the beam of radiation toward the  
6 targeted dermal region through the second end of the skin contacting portion.

1    13.    The apparatus of claim 12 wherein the skin contacting portion further  
2 comprises a window located at the second end of the skin contacting portion, the  
3 window being in optical communication with the fiber; and  
4                                   wherein the skin contacting portion has a fluid passage extending  
5 across at least a portion of the window, the fluid passage circulating a cooling  
6 fluid past the window.

1    14.    An apparatus for treating a wrinkle in human skin, comprising:  
2                                   a source generating a beam of radiation having a wavelength of  
3 between 1.3 and 1.8 microns;  
4                                   a delivery system coupled to the source, the delivery system  
5 directing the beam of radiation to a targeted dermal region between 100 microns  
6 and 1.2 millimeter, below a wrinkle in the skin, wherein the beam of radiation  
7 causes thermal injury to the targeted dermal region sufficient to elicit a healing  
8 response that produces substantially unwrinkled skin; and  
9                                   a cooling system for cooling an epidermal region of the skin above  
10 the targeted dermal region, to thereby minimize injury to the epidermal region.

- 1 15. The apparatus of claim 14 wherein the cooling system comprises a
- 2 container of cold fluid, wherein the cold fluid is sprayed onto the skin and extracts
- 3 heat from the skin on contact.